

REMARKS/ARGUMENTS

Re-examination and favorable reconsideration in light of the above amendments and the following comments are respectfully requested.

Claims 37 - 62 are pending in the application. Currently, claims 37 - 48 and 50 - 62 stand rejected; and claim 49 stands allowed.

By the present amendment, claims 37, 39, 51, and 52 have been amended.

In the office action mailed September 24, 2004, claims 37 - 40, 42 - 44, 51 - 55, 58, 59, 61, and 62 were rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '103 in view of newly cited U.S. Patent No. 4,198,830 to Campbell; claims 39 - 48, 50 - 56, and 58 - 62 were rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '103 in view of Brunskill; claim 48 was rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '103 in view of Brunskill and further in view of Cronin et al.; claim 57 was rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '103 in view of Brunskill and further in view of any one of Afeiche et al., Hipsky or Murry et al.

The foregoing rejections are traversed by the present response.

The present invention relates to an electrically driven aircraft cabin ventilation and environmental control system comprising means for capturing ram air, means for creating a first flow of the ram air and a second flow of the ram air, electrically driven means for receiving the first flow of ram air and for creating a pressurized ram air flow, first means for cooling the pressurized ram air flow, which first cooling means receives the second ram air flow and uses the second ram air flow as a heat sink, second means for receiving the cooled

pressurized ram air from the first cooling means and for cooling and removing moisture from the cooled pressurized ram air, which second means includes a reheater heat exchanger for cooling the cooled pressurized ram air from the first cooling means and a condenser heat exchanger for condensing water vapor contained in the cooled pressurized ram air and for further cooling the pressurized ram air, liquid from the condensed water vapor being separated in the condenser heat exchanger and being used to cool the second ram air flow, the air exiting the condenser being delivered to an opposite side of the reheater heat exchanger to be warmed, expansion means for receiving the cooled ram air from the opposite side of the reheater heat exchanger and for expanding the cooled ram air, and means for delivering said cooled pressurized air from the expansion means to the cabin, which delivering means comprises means for passing air exiting the expansion means through said condenser prior to delivering the air to said cabin.

The present invention also relates to a method for delivering conditioned air to an aircraft cabin comprising the steps of capturing ram air, creating a first flow of ram air and a second flow of ram air from the captured ram air, delivering the first flow of ram air to an electrically driven compressor and pressurizing the ram air in the compressor, providing first means for cooling the pressurized ram air, delivering the second ram air flow to the first cooling means and using the second ram air flow as a heat sink, providing second means for cooling the pressurized ram air and for removing moisture from the pressurized ram air, delivering the cooled pressurized ram air from the first cooling means to the second cooling means, removing moisture from the cooled pressurized ram air in the second means by condensing the moisture out of said cooled pressurized ram air and separating a

liquid formed by the condensed moisture, using the separated liquid to cool the second flow of ram air, providing expansion means and delivering the cooled ram air from the second cooling and moisture removing means to an inlet of the expansion means, and delivering the cooled pressurized air from an outlet of the expansion means to the cabin.

With regard to the rejection of claims 37 - 40, 42 - 44, 51 - 55, 58, 59, 61, and 62 under 35 U.S.C. 103(a) as being unpatentable over Williams '103 in view of newly cited U.S. Patent No. 4,198,830 to Campbell, this rejection fails for a number of reasons. First and foremost, Williams '103 teaches away from making the modifications proposed by the Examiner. In column 1, lines 22 - 38, Williams talks about prior art systems where air is cooled in a secondary heat exchanger and then routed through many optional paths before being fed to an expansion turbine. Williams also talks about how the more circuitous route allows pre-cooling and moisture adjustment. In column 2, lines 10 - 14, Williams teaches away from using such systems. Williams says that the prior systems are recognized as being complex in implementation within passenger aircraft, which adds to the cost of manufacture and maintenance. Williams clearly says that it is an object of his invention to provide an aircraft air conditioning machine of lesser structural complexity. Given this teaching in Williams '103, one of ordinary skill in the art would not be motivated to combine the references in the manner suggested by the Examiner because the modification adds the complexity which Williams '103 seeks to avoid.

Even if one of ordinary skill in the art were to modify Williams with the teachings of Campbell, one would still not arrive at the claimed invention. In particular, claim 37 would be allowable because the proposed combination would still lack

any mechanism for performing the following limitation: "liquid from said condensed water vapor being separated in said condenser heat exchanger and being ~~used to cool~~ supplied to a means for precooling said second ram air flow prior to its use as a heat sink." Campbell teaches separating water in the condenser heat exchanger and either distributing it overboard or to a spray nozzle at the intake of the heating pass of the heat exchanger (22). There is nothing in either Williams '103 or Campbell which teaches taking a separated liquid and supplying it to a means for precooling the second ram air flow prior to its use as a heat sink. Any statement to the contrary by the Examiner would be a misreading of the teachings of Campbell or would be a pure hindsight reconstruction.

Claim 39 is allowable over the proposed combination of references because neither reference teaches or suggests a means for precooling said second ram air flow prior to said second ram air flow being delivered to said first cooling means.

Claim 51 is allowable over the proposed combination of references because neither reference teaches or suggests a spray cooler means for cooling said second ram air flow prior to delivering said second ram air flow to said first cooling means and means for delivering water to said spray cooler from said second cooling means.

Claim 52 is allowable over the proposed combination of references because neither reference teaches or suggests the cooling step of "cooling said second flow of ram air with said separated liquid prior to its delivery to said first cooling means."

Dependent claims 38, 40, 42 - 44, 53 - 55, 58, 59, 61, and 62 are allowable for the same reasons as their parent claims as well as on their own accord.

With regard to the rejection of claims 39 - 48, 50 - 56, and 58 - 62 over Williams '103 and Brunskill, it is submitted that the rejection is fatally defective because it is nothing more than a hindsight rejection.

The Williams '103 patent relates to a ventilation and environment control system which divides ram air into two flows with a first flow being passed to a motor driven compressor and a second flow being passed to a heat exchanger for use as a heat sink prior to being delivered to the ambient. The first flow of ram air exiting the compressor passes through the heat exchanger and then through a turbine prior to delivery to a cabin. Eventually, the ram air is dumped to ambient via a cabin air outflow valve. The compressor is located on a first shaft with a motor. The turbine is located on a second shaft with a motor/generator. The motor/generator and the motor are connected to each other via a system motor controller.

The Brunskill patent is cited for its teachings relating to passing a flow of air through a secondary heat exchanger, a reheater heat exchanger, a condenser heat exchanger, a water separator, and a turbine before being supplied to a cabin. The source of the air however is engine bleed air rather than ram air. Brunskill also teaches mixing a portion of the engine bleed air with the air which has been cooled and expanded prior to delivery to a cabin.

As can be seen from the foregoing discussion, neither of the patents by itself teaches the system and method of the present invention as set forth in claims 39 - 48, 50 - 56, and 58 - 62. A review of the rejection itself shows that the Examiner has done nothing more than identified elements of the claimed method and system which can be found in the prior art. Nowhere in the rejection does the Examiner set forth what in the two references would teach or suggest the proposed combination.

Also, nowhere in the rejection does the Examiner set forth any motivation for the combination. In fact, as previously note above, Williams '103 teaches away from making the proposed combination. It is again submitted that the Examiner has not made a *prima facie* case of obviousness.

As noted in *Environmental Designs, Ltd. v. Union Oil Co.*, 218 USPQ 865, 870 (Fed. Cir. 1983), "virtually all [inventions] are combinations of old elements". As noted by the Federal Circuit Court of Appeals in *In re Rouffet*, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998), "... an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be 'an illogical and inappropriate process by which to determine patentability.'" The *Rouffet* court goes on to say that "[t]o prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problem as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." It is submitted that this is what the Examiner has not done in the most recent office action in the instant application. There are no reasons given why one of ordinary skill in the art would arrive at the arrangement of the combination of elements set forth in the claims. In Applicants'

opinion, there is no reason to combine Williams '103 and Brunskill because they are vastly different systems. The rejection is nothing more than the Examiner finding claimed elements in the prior art. Missing from the rejection is any reason why one of ordinary skill in the art would arrange the prior art elements in the claimed configuration given the teachings of Williams '103.

Assuming the references were properly combinable, claim 39 is still allowable because neither of the cited and applied references teaches or suggests any "means for passing air exiting said expansion means through said condenser heat exchanger prior to delivering said air to said cabin." Neither Williams' 103 or Brunskill have any such means. Williams '103 does not have a condenser heat exchanger. Brunskill has a condenser heat exchanger which separates liquid therein (trap 18), but the air exiting the turbine in Brunskill does not pass through this heat exchanger. Thus, when claim 39 is read as a whole, one can see that the claimed subject matter can not be found there.

Claims 40 - 48 are allowable for the same reasons that their parent claims are allowable as well as on their own accord. It is noted that claims 40 - 48 depend from claim 37 and that the Examiner has not rejected claim 37 on the proposed combination of references.

Claim 50 is allowable because neither of the cited and applied references teaches or suggests means for removing a portion of the pressurized air exiting the electrically driven means upstream of the first cooling means to provide temperature modulation in an air cycle subsystem and air distribution system.

Claim 51 is allowable for the reasons mentioned above. The combination of Williams '103 and Brunskill is improper.

Even if the combination were proper, neither reference teaches or suggests "a spray cooler means for cooling said second ram air flow prior to delivering said second ram air flow to said first cooling means and means for delivering water to said spray cooler from said second cooling means." Nowhere in the rejection does the Examiner address this point.

Claim 52 is allowable for the reasons mentioned above. The combination of Williams '103 and Brunskill is improper. Still further, even if the combination were proper, neither reference teaches or suggests the step of "cooling said second flow of ram air with said separated liquid prior to its delivery to said first cooling means." Nowhere in the rejection does the Examiner address this point.

Claims 40 - 48, 53 - 56, and 58 -62 are allowable for the same reasons as their parent claims as well as on their own accord.

With regard to the rejections of claims 48 and 57 on obviousness grounds, these claims are allowable for the reasons given above and for the same reasons that their parent claims are allowable. The Cronin et al., Afeiche et al., Hipsky, and Murry et al. references do not cure the above noted deficiencies of Williams '103 and Brunskill.

For the foregoing reasons, the instant application is believed to be in condition for allowance. Such allowance is respectfully solicited.

Should the Examiner believe an additional amendment is needed to place the case in condition for allowance, he is hereby invited to contact Applicants' attorney at the telephone number listed below.

No fee is believed to be due as a result of this response. Should the Commissioner determine that an additional fee is due,

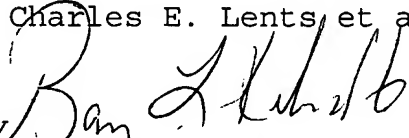
Appl. No. 10/672,651
Amdt. dated December 21, 2004
Reply to office action of September 24, 2004

he is hereby authorized to charge said fee to Deposit Account
No. 02-0184.

Respectfully submitted,

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By



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I, Nicole Motzer, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on **December 21, 2004**.

